

Chapter 2: Purpose and Need

A Purpose and Need Statement for the US 31 project was drafted in May 2001, and presented at a Public Meeting and an Interagency Review Meeting in June 2001. The Purpose and Need Statement was revised following the collection and analysis of updated traffic and crash (accident) data along with comments received. The following information reflects these revisions.

2.1 Traffic Capacity and Congestion Needs

As the area's population, employment, and internal and external travel have continued to increase, so has congestion and delay on area roadways. Many of the intersections along US 31 are operating at minimally acceptable levels during peak hours of travel. These delays are expected to increase with forecast changes in traffic volumes.

2.1.1 Historical Change

Over the last twenty years, traffic volumes on US 31 have nearly doubled (Table 2.1-1). These increased volumes have resulted in decreased levels of service and increased congestion along the corridor. It is important to note that the number of through travel lanes on the facility has remained unchanged during this period.

Table 2.1-1
US 31 Historic Traffic Volumes

Location	1981	1985	1993	1998
South of SR 431	22,490	30,600	39,270	43,270
North of SR 431	24,080	29,440	47,820	56,340

Source: INDOT

2.1.2 Existing Traffic Volumes and Levels of Service (Year 2000)

Level of Service (LOS) provides a measure of congestion on roadways. LOS ranges from A to F, with LOS A indicating the least traffic congestion and LOS F indicating the most traffic congestion (Figure 2.1-1). Intersections control capacity on signalized arterials and are analyzed to determine levels of service along the arterial. LOS is based on the total delay per vehicle at the intersection. INDOT standards state that for a multi-lane urban arterial, LOS C is desirable while the minimum LOS is D.

Existing levels of service at major intersections along US 31 are consistently fair to poor. Seven of the fifteen signalized intersections between 96th Street and SR 38 are experiencing LOS E or F during the morning peak. Similar levels of congestion occur during the evening peak resulting in four of the fifteen intersections reaching LOS E or F.

Traffic congestion is most severe between 96th Street and SR 431, where six of the nine intersections reach LOS E or F during the morning peak and four of the nine reach this level during the evening peak. North of SR 431, delay is less common during the morning peak, with LOS of D or better at five of the six signalized intersections. During the evening peak, all six intersections operate at LOS D or better. As traffic volumes continue to increase on both US 31

Figure 2.1-1 Examples of Levels of Service



Level of Service A



Level of Service B



Level of Service C



Level of Service D



Level of Service E



Level of Service F

Source: Highway Capacity Manual, 3rd Edition
These photos are for illustrative purposes;
roadway is not to be mistaken as US 31.

and intersecting arterials, the warrants for new signals within this northernmost segment would continue to be met, as would the potential for additional points of congestion and delay.

2.1.3 Projected Traffic Volumes and Levels of Service (Year 2025)

Traffic volumes on US 31 are expected to continue to increase by 20 to 40 percent over the next twenty-five years (Note: Future traffic volumes are generated using the Indianapolis Metropolitan Planning Organization (MPO) computer forecasting model). As a result, delay and congestion found in the corridor would exceed that existing today. By 2025, twelve of the fifteen signalized intersections are expected to have LOS E or F during the morning peak and eight of fifteen are expected to reach this level during the evening peak. Eight of these intersections are projected to have LOS F during the morning peak. Congestion is expected to be particularly severe between 96th Street and 136th Street where all of the signalized intersections are expected to reach LOS F during at least a portion of the day. Table 2.1-2 compares the levels of service between the years 2000 and 2025 for each signalized intersection. Figures 2.1-2 and 2.1-3 are graphical representations of the data in Table 2.1-2.

Projected levels of service for US 31 in the year 2025 assume that all projects included in the Indianapolis MPO's 2025 Regional Transportation Plan, except the US 31 upgrade, would be constructed by this date.

Table 2.1-2
US 31 Intersection Levels of Service

Intersection	Existing Level of Service (2000)		Projected Level of Service (2025)	
	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
96 th Street	E	E	E	F
I-465 Westbound Ramps	D	C	F	C
I-465 Eastbound Ramps	E	C	F	C
103 rd Street	E	E	E	F
106 th Street	E	D	F	F
116 th Street	F	F	F	F
126 th Street/Carmel Drive	F	E	F	F
136 th Street	D	D	F	E
Rangeline Road	B	D	B	D
Greyhound Pass	D	D	E	D
151 st Street	F	D	E	C
161 st Street	D	D	F	C
SR 32	D	D	F	F
181 st Street	A	B	C	D
SR 38	C	D	D	E

2.2 Safety

An analysis of crashes (accidents) on US 31 from 96th Street to SR 38 was performed using the data from the INDOT Crash Location Reports for a 4 1/2 year period, from January 1995 to June 1999. From the data, crash rates were calculated for each of the ten segments of US 31 based on the number of crashes per hundred million vehicle miles (HMVM) traveled. These rates were then compared to the 1998 statewide average rates for Other Freeways and Expressways. This analysis revealed that six of the ten segments along US 31 experience crash rates higher than that of the statewide average for similar facilities (Figure 2.2-1). Seven of the ten segments show injury crashes during the time period; two were between 151st and 161st streets and one between

SR 32 and SR 38 (Figure 2.2-2). In general, the statewide average crash rate for an Urban Freeway or Expressway (180 per HMVM traveled) is more than three times the rate for an Urban Interstate (53 per HMVM traveled).

The data was analyzed further to determine the crash types in the corridor. Rear-end and right angle crashes accounted for 50% and 22%, respectively. Rear-end collisions are indicative of high traffic volumes and associated congestion. As congestion increases on a roadway, the distance or time headway between vehicles is reduced, leaving less room for drivers to maneuver or react to changing traffic conditions. In addition, the traffic that backs up from the intersections and from the turning lanes onto the through lanes increases the chances for rear-end collisions. The high percentage of right angle crashes can be attributed to traffic crossing over lanes from uncontrolled points such as driveways or unsignalized intersections.

**Figure 2.2-1
Crash Rates**

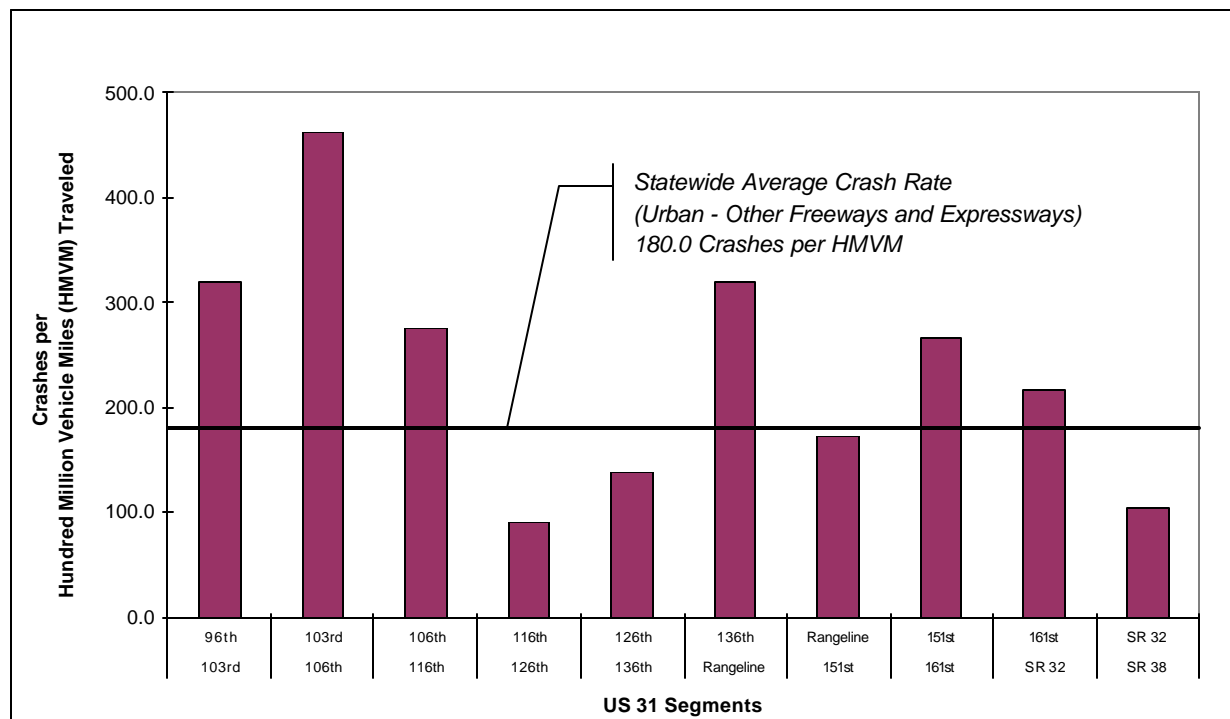
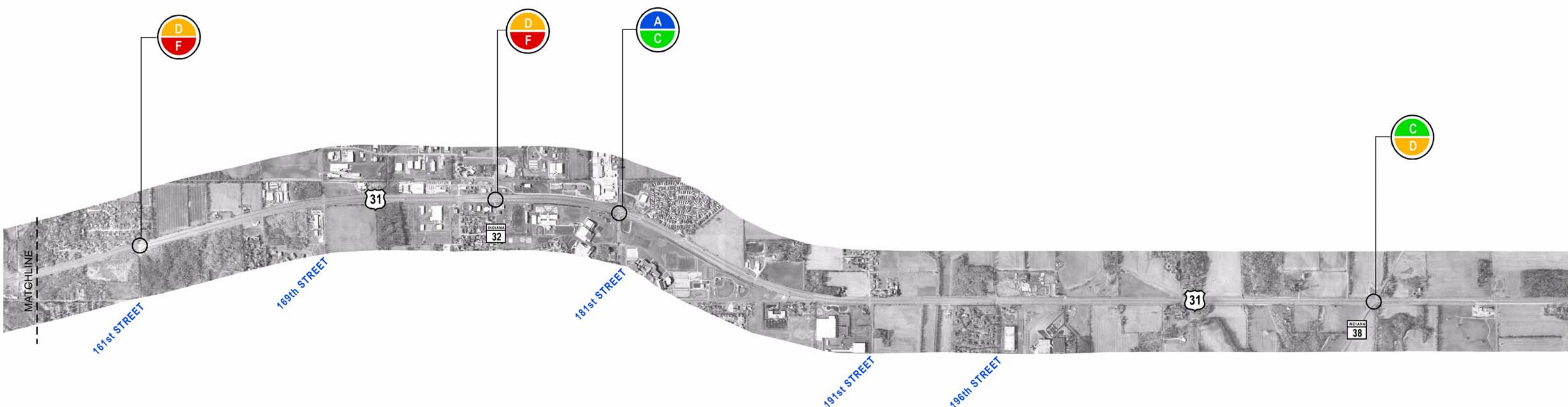
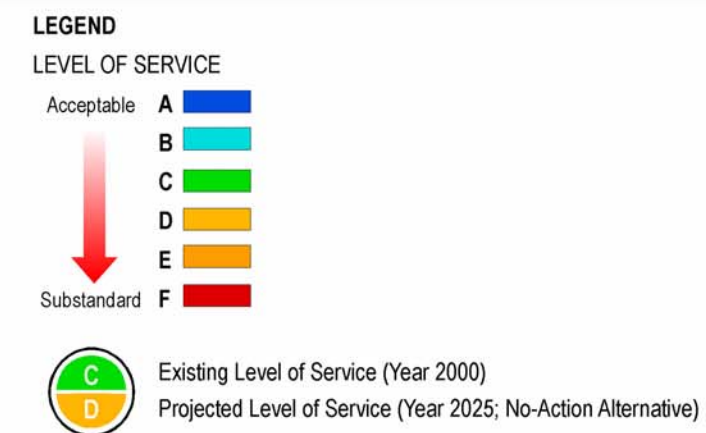




FIGURE 2.1-2 (SHEET 1 OF 2)
EXISTING / PROJECTED
LEVELS OF SERVICE (AM PEAK HOUR)



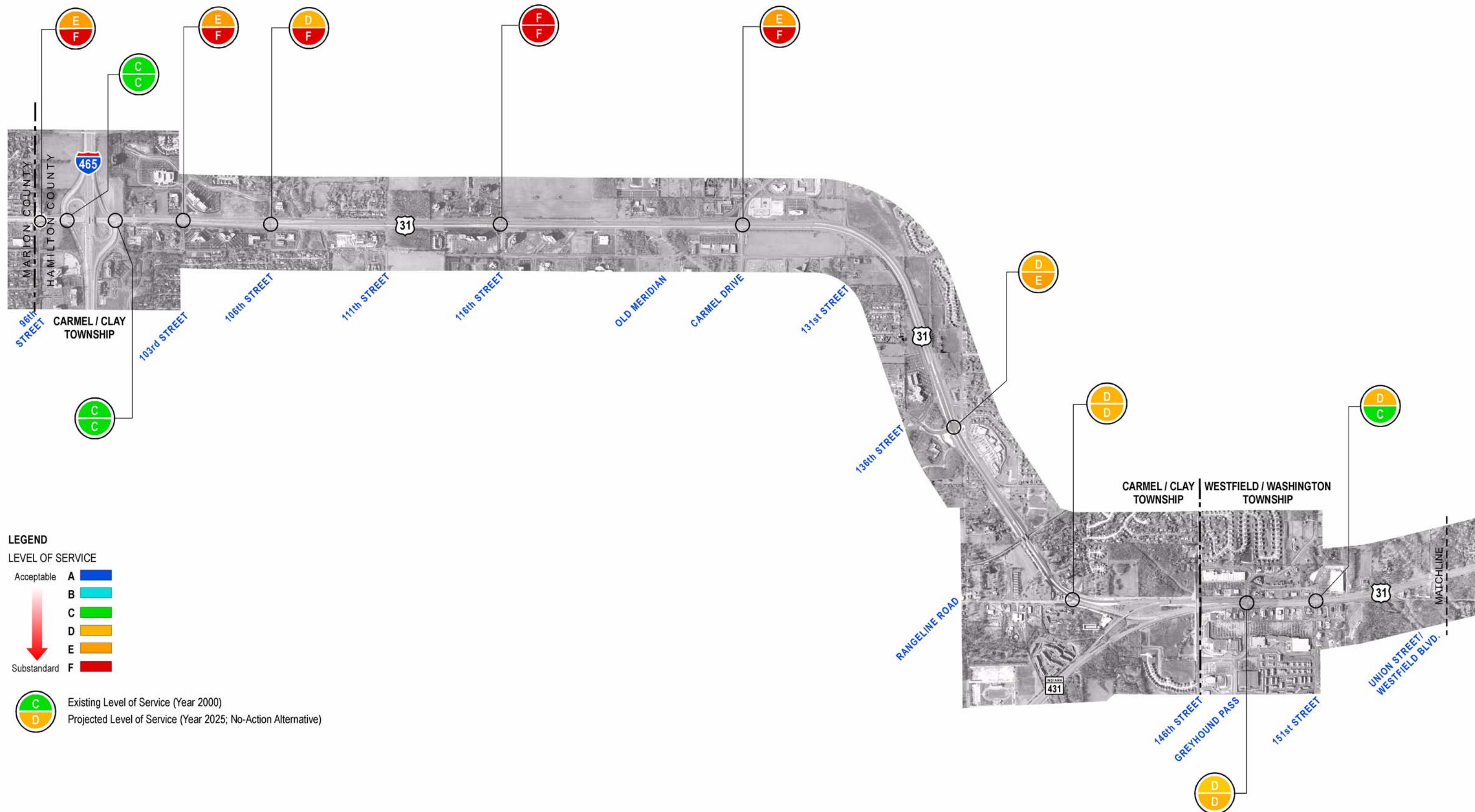


FIGURE 2.1-3 (SHEET 1 OF 2)
EXISTING / PROJECTED
LEVELS OF SERVICE (PM PEAK HOUR)

LEGEND

LEVEL OF SERVICE

Acceptable

A

B

C

D

E

Substandard

F

C

D

Existing Level of Service (Year 2000)

Projected Level of Service (Year 2025; No-Action Alternative)

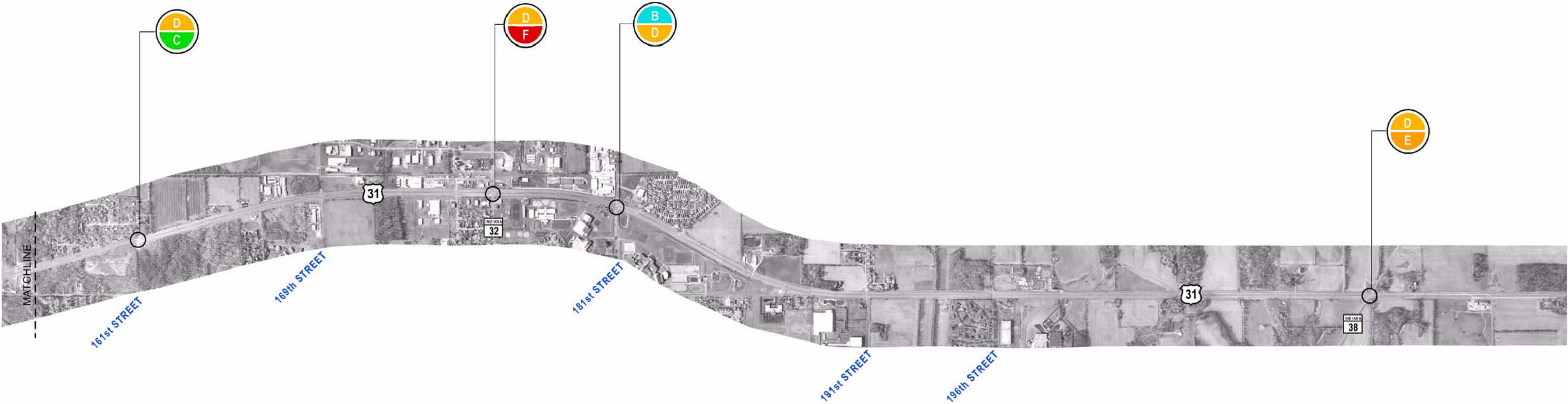
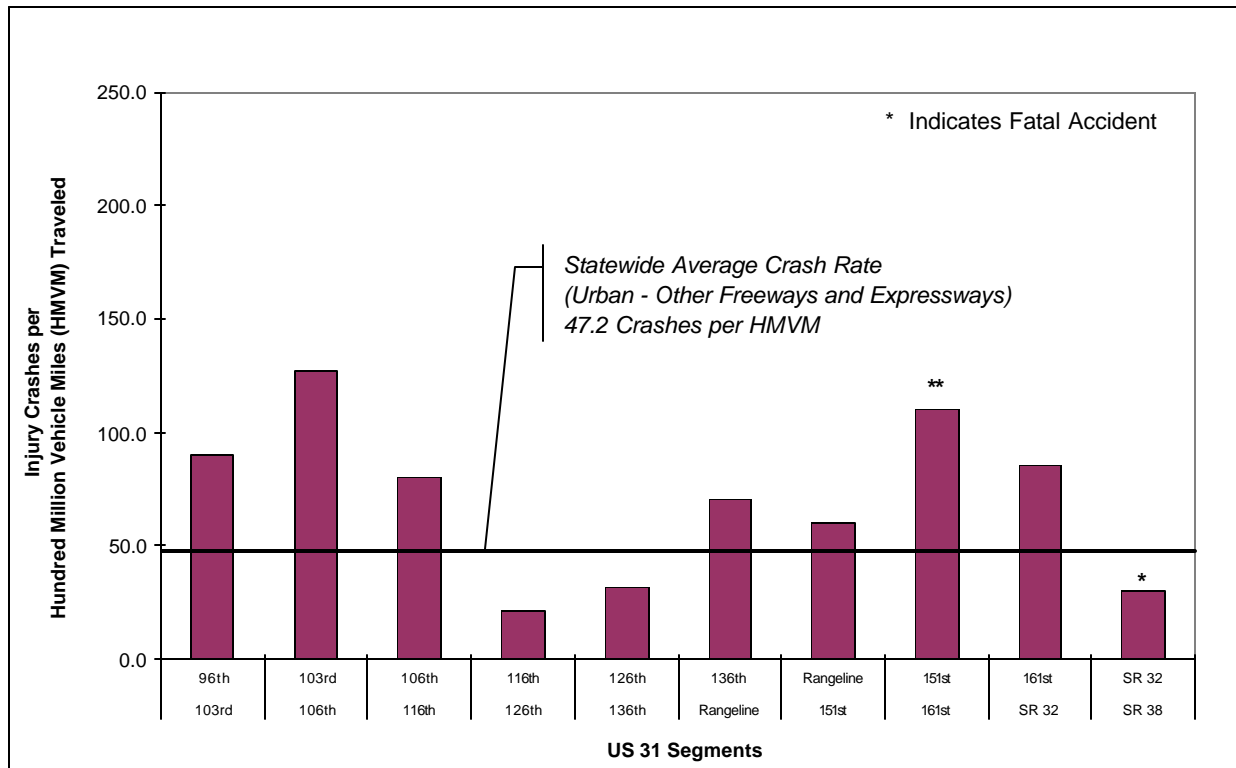


FIGURE 2.1-3 (SHEET 2 OF 2)
EXISTING / PROJECTED
LEVELS OF SERVICE (PM PEAK HOUR)

**Figure 2.2-2
Injury Crash Rates**



2.3 Consistency with Regional (MPO) and Statewide (INDOT) Long Range Transportation Plans

In addition to playing a critical role in Hamilton County's local transportation system, US 31 also serves an important function within the regional and statewide transportation system. It provides a high-capacity connection from the Indianapolis metropolitan area to northern Indiana and central Michigan, a route not served by the Interstate System. More than 10% of the traffic passes through the Indianapolis metropolitan area and is using US 31 for long-distance trips. US 31 also provides a link between the City of Indianapolis and the growing Hamilton County suburbs. US 31 also serves a critical function as a commerce route for trucks traveling to destinations within and outside of the project area. Truck traffic accounts for more than 8% of traffic in the northernmost part of the project area. The shipping industry relies heavily on the Indiana roadway system. The state ranks sixth in the United States for annual truck shipments based on ton miles¹.

US 31 is currently designated as a Statewide Mobility Corridor from Indianapolis (I-465) to South Bend (US 20), a distance of approximately 122 miles, in the INDOT 2000-2025 Long Range Plan. The objectives of these corridors are to provide safe, free flowing, high-speed

¹ Bureau of Transportation Statistics, 1997. Truck Movements in America: Shipments From, To, Within and Through States.

connections between metropolitan areas of Indiana and other states. Characteristics typically associated with such corridors include the following:

- Upper-level design standards
- High speed
- Free flowing conditions
- Serves long distance trips
- Large through volumes of traffic
- Heavy commercial vehicle flows
- Carries longer distance commuter traffic
- Generally multi-lane, divided
- Full access control desirable (no less than partial control)
- Railroad and highway grade separation desirable
- Desirable to by-pass congested areas
- No non-motorized/pedestrian interaction
- Major water crossings

US 31 is also part of the National Highway System (NHS) and Indiana's 4R Road Network.

Regional transportation planning efforts have also identified the need to improve the US 31 corridor. The Indianapolis Metropolitan Planning Organization (MPO) has endorsed, as a part of its 2025 Regional Transportation Plan, an upgrade of US 31 to a multi-lane, divided freeway between I-465 and SR 38.

2.4 Project Purpose and Need Statement

2.4.1 Project Need Statement

Transportation improvements to US 31 between I-465 and SR 38 are needed for the following reasons:

Traffic Congestion and Capacity Needs

- For the base year 2000, 7 out of 15 (47 percent) intersections operate at LOS E or F during the AM and/or PM peak hours (LOS D is minimally acceptable based on INDOT's current standards).
- By the year 2025, 13 out of 15 (87 percent) intersections are projected to operate at LOS E or F during the AM and/or PM peak hours.

Safety

- Six of the ten roadway segments on US 31 have crash rates greater than the statewide average for similar facilities.
- Seven of the ten roadway segments on US 31 have injury crash rates greater than the statewide average for similar facilities.

2.4.2 Project Purpose Statement

Based on the transportation needs listed, the purpose of the US 31 Improvement Project is to:

- Reduce congestion for the US 31 corridor by improving to LOS D or better;
- Improve the level of safety for motorists using the US 31 corridor; and
- Provide for the reliable and efficient movement of commerce and regional travel.

2.4.3 Consistency with Regional (MPO) and Statewide (INDOT) Long Range Transportation Plans

As previously discussed, US 31 has been designated as a Statewide Mobility Corridor by INDOT's 2000-2025 Long Range Transportation Plan, is part of the National Highway System (NHS), and represents the only continuous transportation link between Indianapolis and north-central Indiana (e.g., South Bend). As such, the objectives of the US 31 corridor are to provide safe, free flowing, high-speed connections with characteristics consistent with Statewide Mobility Corridor designation.

Improvements to the US 31 corridor have been also identified in the Indianapolis MPO 2025 Regional Transportation Plan.

2.4.4 Evaluation Criteria for Meeting Purpose and Need

The criteria established to evaluate each project alternative's ability to meet the purpose and need of the project include the following:

- Improve congestion to LOS D or better.
- Reduce crash rates.
- Provide a facility with characteristics consistent with the criteria in INDOT's 2000-2025 Long Range Transportation Plan for Statewide Mobility Corridors*.

* Consistency with criteria for Statewide Mobility Corridors was not a requirement to satisfy the project's purpose and need.